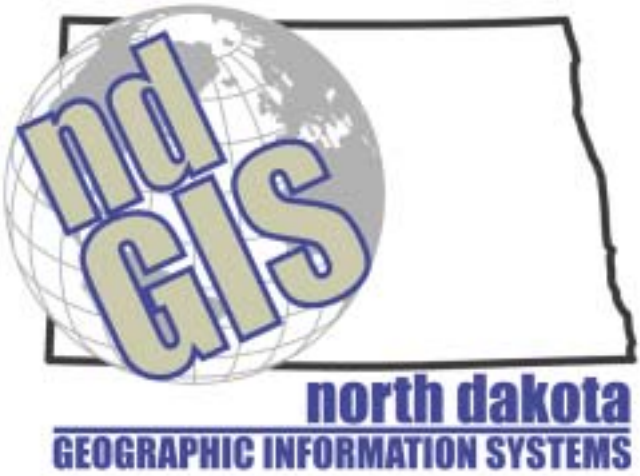
North Dakota GIS Initiative Report
To Governor John Hoeven

July 1, 2003 – June 30, 2004



Executive Order 2001-06: "The committee shall issue a report to the Governor's office at the end of each fiscal year, detailing progress, and problems encountered with GIS development in the state."

Prepared By: Bob Nutsch
Information Technology Department

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Executive Summary

The Geographic Information System (GIS) initiative in North Dakota during the period July 1, 2003 – June 30, 2004 was marked by several achievements:

- State agencies are actively using the GIS Hub.
- Multiple GIS Hub applications have been developed.
- New data sets have been added.
- A program for putting GIS into K-12 schools has begun.
- A state-wide road centerline project has begun.
- Received a grant to make North Dakota GIS data available to the National Map.
- A pilot project to test the Geographic Coordinate Database has been started.

Since 2002 when the GIS Hub went into production the GIS Technical Committee (GISTC) has continued to focus on building upon the GIS Hub by adding data and applications. The GISTC is working to increase awareness of the Hub by promoting its use, value and functionality.

The Hub, which is hosted within the State Information Technology Department's infrastructure, is the foundation of GIS work in the state. Although the Hub serves state agencies as a first priority, other levels of government and citizens also benefit from the GIS Hub. Agencies can utilize the GIS Hub infrastructure for applications to be used internally or provided to their constituents, saving them from having to build their own duplicated infrastructure. With the Hub, data is now available through several standardized interfaces and in a seamless and common format. The GISTC is the key factor in promoting new and updated GIS Hub data which is key to existing, new, and planned GIS Hub applications.

During this report period, several GIS Hub applications were made available. The Devils Lake flood risk assessment was unveiled by the Division of Emergency Management. The Tax Department released their Sales Tax Rate tool, developed by Kadrmas, Lee and Jackson of Bismarck. The DOT released their Road Construction and Road Restriction applications. The State Water Commission now has available a Well Information System and a Precipitation Information System. Several agencies, e.g., the Health Department, are planning to use the GIS Hub for applications to be developed. More than one vendor has commented that the state is fortunate to have a system such as the GIS Hub in place for planned applications.

New data that have been loaded onto the GIS Hub over the past year include: state-wide mosaic of U.S. Geological Survey aerial photos, Devils Lake aerial photos and shaded relief image, National Elevation Dataset Digital Elevation Model and shaded relief image, road mile markers, Fargo trails, Bismarck/Mandan high-resolution aerial photos, and U.S. Department of Agriculture National Agriculture Imagery Program color aerial photos.

A program for putting GIS into the curriculum of K-12 schools in North Dakota has begun. This project is being managed by the Department of Career and Technical Education with grant funding. The total cost for this program is based on $25 per school (public and private) and will be paid for by the Department of Career and Technical Education. As long as the software used for education, an unlimited amount of GIS software is given at no charge to any school that is

interested. Initially the program will be targeted towards high school students. A "train the trainer" program will be completed during July 2004.

Using homeland security funding, the Division of Emergency Management, working with the Department of Transportation, the GIS Technical Committee, and the ND 911 Association, has started a project to collect a highly accurate GIS layer representing the centers of all significant roads in the state including attributes of the roads. This will be a very important data set for the state that will see heavy use for many years to come. This seamless, state-wide data set will be utilized for emergency responders and 911 purposes. The data will also find wide use by state agencies and counties. During July 2004 the vendor will be chosen and after the contract is signed, the approximately 18-month project will begin.

The Information Technology Department has been notified that it will be receiving a small grant from the U.S. Geological Survey to implement some functionality of existing GIS Hub software that will make the GIS Hub data available to the National Map. The National Map is a public tool that allows the user to view data across the country. When zooming in to North Dakota, much of the data shown will be drawn from the GIS Hub. Other organizations, including the private sector, will be able to make use of this new functionality. The GISTC will continue to explore collaboration opportunities with various federal agencies.

A pilot project managed by the U.S. Bureau of Land Management has begun with Golden Valley County and Billings County to determine the utility of the Geographic Coordinate Database (GCDB). The GCDB is a method for storing the Public Land Survey System (PLSS) data in such a manner that positional accuracies can be displayed. Data such as land parcels that are currently tied into existing PLSS data can be tied into the GCDB. Once in place, the GCDB can be used by utilities, surveyors, counties, and other interested parties. The GCDB provides a seamless, common interface to the PLSS data and data from that project will likely be housed on the GIS Hub.

Monthly Highlights

July 2003

- The GIS Hub web services are part of the national Geospatial One-Stop Portal (http://geodata.gov/). When searching for data in the Dakotas, data from the Hub's web services will appear.
- There is an article in the July 2003 issue of the Government Technology magazine on the GIS Hub. A freelance writer interviewed myself, Brian Hosek (G&F), Rod Bassler (SWC), Tim Reed (SHS) for the article. The online article is found at http://www.govtech.net/magazine/story.php?id=57992 . I have been receiving a number of emails, with questions as a result of this article. A person from New York was surprised at the low cost of our project.
- Participated in Devils Lake Risk Assessment tool roll-out and announcement at Devils Lake. The demonstration that I gave was part of the State Flood Coordination Center meeting that included county emergency management coordinators, city and

county officials, and the public. The web site is available at http://www.state.nd.us/gis/resources/gisnd/dl/.

- At the July GISTC meeting a representative from State Radio discussed his vision for E-911 in the state and the need for road centerlines with attributes in the state.
- Met with the Health Dept. regarding the Disease Surveillance System that is being developed. The GIS portion of this will be hosted on the Hub. The ESRI vendor at the Health meeting commented that we as a state are very fortunate to have the Hub infrastructure in place for this project as not many states have something similar.

August 2003

- Gave a presentation on the GIS Hub to approximately 75 people at the ND Association of Assessing Officers meeting. I was invited to this meeting to present an update on the Hub and to provide ideas to the assessors.
- Met with the DOT as part of a cost estimate to convert their existing manual system used to create load restriction, road construction, and road condition maps to a Hub-based system.
- Met with the North Dakota Society of Professional Land Surveyors to discuss the Geographic Coordinate Database (GCDB) which is organized by the Bureau of Land Management (BLM). This data could be hosted on the Hub. This data would be considered a base layer and can improve accuracy of all located data within the state, provide a common standard for GIS users, and help quantify the accuracy of each survey point.

September 2003

- Attended State Mapping Advisory Committee (SMAC) meeting at the Geological Survey. This is the committee that sets geologic and other mapping priorities within the state. As per Executive Order 2001-06 the SMAC membership list must be approved by the Governor.
- Attended Geographic Coordinate Database (GCDB) organized by the BLM. Golden Valley and Billings are the two pilot counties that will work with the BLM to investigate using the GCDB in their GIS systems, particularly with their tax parcels.
- The Water Commission's two web sites are currently in production. These show precipitation and water well information (http://www.state.nd.us/gis/mapsdata/maps/agency-maps.html).
- Attended National States Geographic Information Council in Nashville, September 14-18. This was a great conference of state GIS coordinators along with representatives from the U.S. Census Bureau, U.S. Geological Survey, U.S. Bureau of Land Management, etc.
- Met with the ND Career and Technical Education Committee to discuss putting GIS into K-12 schools. For $25/school along with "training the trainers" we can start this program.
- Met with ND-911 association where I gave a brief presentation on the Hub and what GIS can do for 911 and emergency management. I will become a member of the ND-911 GIS sub-committee.

- During September, there were 6,542 initial hits to the Hub Explorer, and 35,111 "other hits" to the maps which include zooming, panning, etc. There were nearly 57,000 hits to the GIS web site.

October 2003

- Completed minor upgrade to Devils Lake risk assessment website to allow searching by county, city, and township. This was requested by a Devils Lake area county person and paid for the by the DEM.
- Discussions with Emergency Management who is wanting to create an RFP for development of a state-wide centerline database at 3-meter accuracy. Although this would be an improvement over what we have I've voiced concerns that should be addressed: 1) accuracy required by the majority of data users, 2) attributes required for address matching and routing, 3) involvement by local government, 4) maintenance of data, and 5) involvement by the DOT. We plan to convene a meeting of the GIS Sub-Committee of the 911 Wireless Committee as soon as possible to give the counties a chance to voice their concerns.
- Interim GISTC meeting on October 20 to discuss concerns of the GISTC regarding costs and control of their GIS servers in light of consolidation.

November 2003

- Discussions with Emergency Management regarding the road centerline project continue. During that meeting it was announced that the DOT is beginning to take an active role on this project. They will create a specification for the data to be collected and will write the RFP.
- During the recent GISTC meeting, a draft of near term, 1-3, 3-5, 5-7 year GIS initiative goals was discussed. The aim of these goals is to set metrics for measurement of progress and to provide a clear and documented vision of the priorities set by the GISTC. We plan to call this our "New Vision Document."
- The NDSU 4-H Extension Service contacted me to let me know that they have a project titled, "Rural Community Mapping: 4-H Youth Favorite Places" that includes hosting of GIS and other data. Sun Microsystems has donated a server for the project. We've been asked to be a partner in this project.
- Attended a ND-911 meeting. Part of this meeting including discussion on sending out a new survey to the counties requesting information on their GIS data, mapping activities, and hardware/software. The information from this survey will feed into the DEM state-wide centerline project.
- GIS Day was a success with 122 registered attendees. Approximately 40% are from state agencies, , 18% from businesses (consultants and public companies), 16% from counties, 13% from higher education, 8% from federal agencies, and 4% from cities.
- Met with the ND Career and Technical Education group and with Roger and Anita Palmer. The Palmers are GIS in grade K-12 consultants, having lived and worked in Grand Forks and now in Texas. We plan to have frequent meetings to discuss and design the GIS in schools strategy. The Palmers told us that very few states are in the same position as we are, where there is a centralized, easy to access store of GIS data.

December 2003

- Rod Bassler at the Water Commission completed the seamless aerial photos coverage for the state. This was a big undertaking and is very useful to the agencies.
- Met with the ND 911 GIS sub-committee and full committee. During the regular 911 meeting a 100% unanimous resolution in support of the DEM submitting an RFP to create a seamless state-wide coverage of road centerlines was passed. The DOT is drafting the RFP and will be using input from the GISTC and from the ND911 GIS sub-committee.
- Met in the Governors Office with Bill Goetz, DEM, and senior level people from the GISTC agencies to discuss the state-wide road centerline project. This was a meeting to be sure that the executive level of the agencies are comfortable with the direction and progress of the project. It appears that people are fine with the current status.
- After organizing the people and schedule, I handed over coordinated GIS training to Bullberry Systems, a subsidiary of Kadrmas Lee and Jackson. The people will be trained in January by an authorized ESRI Bullberry trainer in their facilities.

January 2004

- Coordinated training for ArcGIS was conducted in the training lab at KLJ in Bismarck. There were 8 students from 4 state agencies, representing a training-only cost savings of $2,800. Another class is planned for February and March.
- Participated in ND-911 call in which we reviewed the draft of the DOT road centerline RFP. Our recommendations will be forwarded to the DOT to be included in the RFP that is sent to the DEM

February 2004

- The DOT Road Report application is now in production. The Road Report application replaces the manually generated map and also adds an interactive map as a new option.
- High resolution aerial photos of the Bismarck-Mandan area are now on the Hub. This data was obtained by the Game and Fish from the two cities. The GISTC hopes to get more of this kind of data from other cities.
- Attended the Minot ND Tech Expo in the ITD booth. We had a number of people stop in with an interest in GIS: a real estate agency who was very excited about the data download and web services, a couple of people interested in the Hub data for planning hunting trips, a guy from the NDSU extension office who is interested in what we are doing.
- Participated in another ND-911 conference call in which we reviewed a new draft of the DOT road centerline RFP. The DOT has sent drafts of the RFP to the DEM for review and they continue to communicate.
- The Load Limit application from the DOT is now in production.
- Participated in a conference call with several people from other states and the Federal government to discuss use of and improvements to 'geodata.gov,' a US-wide portal to geographic data. ND Hub data is already available on this site.
- Published "in progress" data from the Health Department to the Metadata Explorer. Data that is currently being collected and being put together is described in metadata

then published. This allows people who are interested in the status of various projects to visit one web site to get this information

March 2004

- Vector data downloading is now available using either the Metadata Explorer or the Hub Explorer.
- I gave a presentation at the Interim IT Emergency Services Committee at the request of the Legislative Council. I described how GIS can and is being used to plan and manage disasters.
- The GISTC approved a "New Vision Document" that lists the objectives out to 2010. This is also on the Web at http://www.state.nd.us/gis/about/goals/ .
- The Health Department will be purchasing a GDT data license that allows up to 25 users, to be split as they see fit. We will be amending the existing license that was first put into place at the request of the Tax Department.
- Gave a brief presentation to the Interim IT Committee March 17.
- Coordinated GIS training took place March 29-31 with 10 students. The students were from state agencies, cities, counties and federal agencies. The state agency savings was about $600. The DOT graciously allowed the use of their training lab, we used an ESRI instructor. Since the start of this coordinated training program in February 2002, state agencies have saved $39,000 in training costs alone. If one considers what it would have cost to send people to training out of state, the cost savings is about $115,000.
- Met with the "Aerial Photo Project Team" March 23 to discuss updating Bismarck/Mandan aerial photography. The Hub is currently making use of the high resolution photos from 2001. We are investigating updating the 2001 data and/or cost-sharing with the Federal Government.
- Attended the Finley Technology Expo in Finley, ND. A small conference, but because it was located in the school we had good traffic. The kids loved the GIS stuff.
- The DEM road centerline RFP has been released.
- I received an application packet from a student at UND for the NASA remote sensing internship. I submitted a cover letter and attached it to the packet, sending it to the contact at the Western Governor's Association. I sent a copy of the cover letter to Bill Goetz at the Governor's Office.

April 2004

- An order was placed for 926 aerial photos to replace older ones on the Hub. This data was delivered to us on April 13.
- At the GISTC meeting we discussed our plans for GIS Day. We will be combining GIS Day with our annual "Full GISTC" meeting to save on logistics.
- We received some of the new color aerial photos from the USDA. Initial tests show that this will be a large data set to store and expensive to store at the current storage rates.
- I attended the MidAmerica GIS Consortium (MAGIC) conference April 17-22. This was a very good conference with a good mix of technology and "big picture" presentations and workshops. I will be creating a report.

- Provided GDT data to the Health Department – for the DREAMS system.
- Met with the Department of Career and Technical Education to discuss the status of getting GIS into the school system. Things are moving along well, with plans to "train the trainers" in July.
- Submitted a "partnership" grant proposal to the U.S. Geological Survey as part of the National Map project. If this comes to pass, additional software will be used on the Hub to allow the Hub data to be made available to the National Map web site.

May 2004

- Charles Geraci from UND has been selected to represent ND as a NASA remote sensing intern. He responded to an announcement by the Western Governor's Association (WGA) that I sent out to the GIS listserv. I provided a cover letter with the application packet that I received from him, then sent the entire package to the WGA.
- The DEM has received three responses to the state-wide road centerline RFP.
- Met with the Disease Surveillance group of the Health Department and took part in a conference call to discuss using the SAS statistical package with the Hub.
- Sent a letter of support to UND as part of their request for a USGS AmericaView (http://www.americaview.org/) grant. The AmericaView program, which includes a focus on remote sensing and education is focused on higher education within the states. It has possible ramifications for the Hub in terms of data storage.
- I met with two people from Ward County. We discussed data sharing opportunities and the possibility of the Hub hosting an ArcIMS web site for them. Other states such as Utah are offering similar packages to their counties.
- I received notification that we will be receiving a $2300 grant from the U.S. Geological Survey to supply Hub data to the "National Map." I submitted the application in late April. We will use the funds to pay for our time in turning on and testing some additional ArcIMS software.

June 2004

- Attended (and helped to set up) a North Dakota Geographic Coordinate Database (GCDB) meeting hosted by the Bureau of Land Management (BLM).
- The 2003 color aerial photographs are now loaded on the GIS FTP server. These photographs are organized by county. These came to us at no cost through the local Natural Resources Conservation Service (NRCS) working with the North Dakota Geological Survey.
- Submitted a letter to the Standing Rock Tribe in support of their request for a GIS grant.
- Visited with the city and county of Grand Forks to share with them the status of the GIS Initiative.
- Took part in the vendor interviews for the road centerline project June 9,10. The evaluation team interviewed BullBerry Systems, Baker Corporation, and Woolpert, Inc. using a standard set of questions.
- Met with people from the Sitting Bull College and Standing Rock at Fort Yates. I gave them a brief PPT presentation of the Hub and how they could be involved.

- Brad Rundquist at UND has been notified that UND is a recipient of an AmericaView (http://www.americaview.org/) program grant. This is good news for the state.
- Met with people from the Bismarck-Mandan Metro Planning Organization (MPO), Burleigh County, and the City of Bismarck as part of the planned acquisition of new aerial photography in 2005.

Future Goals

- GIS Outreach: Greater involvement with other levels of government, e.g., counties and cities. Develop memorandums of understanding for data sharing and possible hosting of web sites. Other states are doing this now.
- Greater involvement with federal GIS initiatives, e.g., the National Map, Geospatial One-Stop.
- Training in the effective use of the Hub in the form of informal seminars around the state.
- Continue to develop and enhance the Hub with additional data, functionality, and applications. Some data should be developed with the State being an active financial contributor. Other states with successful GIS programs are doing this.
- Continue to market the Hub, making people aware of its flexibility and functionality.
- Improved GIS standards for data collection accuracy, naming conventions, etc.
- Continue to make the Hub and GIS an integral part of daily State government business and service to the citizens of the state.

Challenges

- Continued funding, including increased funding to continue to further develop the GIS Hub.
- Data acquisition – the GISTC and the State Mapping Advisory Committee (SMAC) will continue working to identify data needs and prioritize them.
- Streamlined GIS activities in the state – a state-wide GIS strategy should be developed that encompasses state agencies, counties, cities, tribal, and higher education to maximize the benefits offered by the Hub. Bridges of communication must be established between the various centers of GIS activity within the state. This has begun to happen, but more needs to be done.
- Spatially accurate centerlines with consistent and accurate attributes for county and city roads throughout the state do not exist. This information is needed for day-to-day needs of agencies using GIS and is necessary if planned systems such as E-911 are to successfully exist. The beginning state-wide centerline project organized by the Division of Emergency Management will address this important issue.
- The IT consolidation project mandated by the legislature is impacting the GIS Hub to some degree and may continue to do so, though the level of impact is difficult to accurately measure. The greatest impact brought on by consolidation is that by nature GIS tends to work well in a distributed environment where GIS data used in an application can be sourced from the Hub and agency servers. With servers and

storage being moved in to ITD, some agencies will be restricted in the kind and amount of data that they will be able to generate, to be used by the Hub. If storage costs at ITD are reduced, this problem will be somewhat mitigated. The GISTC plans to acquire large, detailed data sets such as aerial photography, digital elevation models, and satellite imagery. These data sets will consume large amount of storage, in some cases one data set alone can require a terabyte or more or storage. If storage costs are not reduced, the GISTC may not be able to load these data sets onto the GIS Hub due to GIS budget restrictions.